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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/734,803

12/12/2003

Joseph Carmine Centanni

Centanni 2-32-9-22-5-7

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EXAMINER

CURS, NATHAN M

ART UNIT

PAPER NUMBER

2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/734,803

Applicant(s)

CENTANNI ET AL.

Examiner

Nathan Curs

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The applicant's amendment of 8 January 2007 amends claims 1, 10, 18 and 20, changing the limitation "second order non-linear effect" to "third order non-linear effect" and making corresponding changes in the specification in order to support these amendments. The applicant's remarks state that the occurrence of "second-order" terminology in the original specification was a typographical error. However, the recurrent use of the correctly spelled "second-order" terminology throughout the original specification and original claims undermines the argument that such use was a result of mistyping "third-order". The applicant's further remarks of 8 January 2007 regarding the "third-order" terminology merely state that one of ordinary skill in the art would recognize the parametric processes originally disclosed as "second-order" to be instead "third-order". This is not sufficient to show that the "third-order" amendments are not introducing new matter.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 4, 9-11, 14 and 16-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Chou et al. ("Chou") (US Patent Application Publication No. 2005/0280886).

Regarding claim 1, Chou discloses an optical switch (paragraph 0015), comprising: a first optical combiner for combining at least two optical pump signals to produce a combined pump signal, and a second optical combiner for combining an input data signal with the combined pump signal to produce a combined signal (fig. 4 and paragraphs 0068-0071); a non-linear optical element for imparting a second-order non-linear effect on the combined signal (paragraphs 0023, 0024 and 0044); at least one optical splitter for separating the combined signal from said non-linear optical element into respective generated optical bands (fig. 7 and paragraphs 0091 and 0092); wherein at least one of said at least two optical pump signals is controllably modulated such that a logic sequence of said input data signal is controllably switched (fig. 4, elements 96 and 98 and paragraph 0070).

Regarding claim 2, Chou discloses the optical switch of claim 1, further comprising at least two optical pump sources, each of said sources providing one of said at least two optical pump signals (fig. 4), wherein at least one of said at least two optical pump sources is adapted to controllably modulate its respective optical signal such that a logic sequence of said input

data signal is controllably switched and an output signal of said optical switch comprises a multi-band switched optical signal (fig. 4 and paragraphs 0070 and 0091).

Regarding claim 4, Chou discloses the optical switch of claim 2, further comprising a controller for controlling the modulation of the at least one modulated optical pump source (paragraph 0070, where controlling the presence or absence of each pump beam in the mixer requires an inherent pump modulation controller).

Regarding claim 9, Chou discloses the optical switch of claim 1, wherein said non-linear optical element generates a parametric amplification of the combined signals (paragraph 0023).

Regarding claim 10, Chou discloses the optical switch of claim 9, wherein said second-order non-linear effect comprises difference frequency generation (paragraph 0023).

Regarding claim 11, Chou discloses the optical switch of claim 9, wherein an output of said optical switch comprises a replica of said input data signal and at least three idler signals (fig. 7 and paragraphs 0091 and 0092).

Regarding claim 14, Chou discloses the optical switch of claim 9, wherein each wavelength of said input data signal is converted into a corresponding wavelength in said respective generated optical bands (fig. 4 and paragraph 0070).

Regarding claim 16, Chou discloses the optical switch of claim 1, wherein said at least one optical combiner comprises a band splitter (fig. 7 and paragraph 0091, where a wavelength directional coupler reads on a band splitter).

Regarding claim 17, Chou discloses the optical switch of claim 1, wherein said at least one optical splitter comprises a band splitter (fig. 7 and paragraph 0091, where a wavelength directional coupler reads on a band splitter).

Regarding claim 18, Chou discloses a method of optical switching (paragraph 0015) using a fiber parametric device having at least two optical pump sources (fig. 4 and paragraph

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0070), comprising: combining a signal from each of said at least two optical pump sources in a first combiner to produce a combined pump signal, and combining the combined pump signal with an input data signal to produce a combined signal (fig. 4 and paragraphs 0068-0071); imparting a second-order non-linear effect on the combined signal (paragraphs 0023, 0024 and 0044); and controllably modulating at least one of said at least two optical pump sources such that a logic sequence of said input data signal is controllably switched (fig. 4, elements 96 and 98 and paragraph 0070).

Regarding claim 19, Chou discloses the method of claim 18, further comprising separating said combined signal into respective generated optical bands (fig. 7 and paragraphs 0091 and 0092).

Regarding claim 20, Chou discloses the method of claim 19, wherein said second-order non-linear effect generates a parametric amplification of said combined signal such that an output of said fiber parametric device comprises a multi-band switched optical signal (paragraph 0023, and fig. 4 and paragraph 0070).

Regarding claim 21, Chou discloses the method of claim 20, wherein the output of said fiber parametric device comprises at least a replica of said input data signal and three distinct idler bands (fig. 7 and paragraphs 0091 and 0092).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou (US Patent Application Publication No. 2005/0280886) in view of Farries et al. ("Farries") (US Patent No. 5127928).

Regarding claim 8, Chou discloses the optical switch of claim 1, and discloses that a variety of nonlinear optical materials can be used for the optical mixer (paragraph 0023), but does not disclose that said non-linear optical element comprises a highly non-linear fiber. Farries discloses optical mixing using second-order nonlinear fiber (col. 3, lines 28-68). It would have been obvious to one of ordinary skill in the art at the time of the invention to use second-order nonlinear fiber as an engineering design choice in implementing the second-order nonlinear optical material already disclosed by Chou. The type of nonlinear optical material claimed merely amounts to the selection of expedients known as design choices to one of ordinary skill in the art.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou (US Patent Application Publication No. 2005/0280886).

Regarding claim 15, Chou discloses the optical switch of claim 2, but does not explicitly disclose that said optical pump sources comprise laser sources. However, the office takes office notice that optical pump light used to pump nonlinear optical materials is conventionally created using pump lasers. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use pump lasers to create the pump light of Chou, to provide the benefit of providing the pump light at the specific wavelengths needed for the nonlinear processes.

Response to Arguments

8. Applicant's arguments filed 8 January 2007, with respect to the "third-order" terminology amendments, have been considered but are not persuasive for the reasons provided above under the 35 USC § 112-1st paragraph rejections.

9. Applicant's arguments filed 8 January 2007, with respect to the rejections under Ciaramella have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Chou.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Conclusion

11. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://paired.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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